

MPAC
PANEL

PLUGBOARD PROGRAMMING SYSTEMS

OEM DIVISION CATALOG 101



RECEIVERS

The receiver is the frame and engaging mechanism which accepts the removable plugboard. It contains the stationary contact springs which mate with the plugwire tips in the plugboard. On the models 901, 902, 903, 904, 921 and 922, the receiver is equipped with rails in which the plugboard is inserted from the top. On the remainder of the models, 908, 909, 910, 911 and 912, the plugboard is placed in the receiver bed from the front so that no vertical clearance is required. On the latter models, an integral door is incorporated so that the system is covered when the receiver is in the closed position. When in an open position, the plugboard in the receiver is angled towards the operator for easy plugwire changes.

All receivers are equipped with a mechanical interlock to prevent closing of the receiver if the plugboard is not properly seated. On the large systems, models 908 and 910, dash pots are employed to control the rate of opening and closing to eliminate mechanical shock.

MATERIAL AND SPECIFIC WEIGHTS

RECEIVER FRAMES

	Models	Materials
Stationary	901, 902, 903, 904	Aluminum (Polished)
	908, 909, 910, 911, 912, 921, 922	Steel (Satin Chrome Plated)
Movable	All Models	Steel (Satin Chrome Plated)

RECEIVER PANELS

Material	Leakage Resistance Between Adjacent Holes	Hole Spacing (Center to Center)		
		Model	Horizontal	Vertical
Phenolic	$> 5 \times 10^{10}$	901, 909	.281"	.281"
Diallyl Phthalate (mineral filled, nylon fibre reinforced)	$> 1 \times 10^{13}$	All Other Models	.250"	.281"

CONTACT SPRINGS

Material	Plating Thickness	Average Contact Resistance	Continuous Current Rating	Maximum Operating Voltage (Sea Level)
Beryllium Copper (Heat Treated)	Nickel .0001"	Nickel Contact Spring to Nickel Tip .009 Ω	5 Amperes at 68° F	1500v DC/1000v RMS AC
	Gold .00006" (over .0001" Nickel)	Gold Contact Spring to Gold Tip .004 Ω		

CAPACITANCE AND INDUCTANCE

		Phenolic	Diallyl
CAPACITANCE between adjacent contact springs and plugwire tip combination:	Horizontal	5.0 mmf.	5.98 mmf.
	Vertical	4.25 mmf.	5.10 mmf.
CAPACITANCE between one contact spring-plugwire tip combination and eight surrounding:		12.95 mmf.	15.5 mmf.
INDUCTANCE of contact spring—plugwire tip combination:		.05 μ h	

CLOSING ACTIONS

Models 908, 909, 910, 911 and 912, the plugwire tip first makes contact at an angle (A) moving in below the contact spring. As the closing action continues, the wire tip moves to the center (B) and then to the right (C). In the process of closing, the contact spring travels 3/16" along the straight portion of the plugwire tip.

Models 901, 902, 903, 904, 921 and 922 are bottom pivoted and produce the necessary wiping action as the plugwire tip makes contact (A) and continues its upward wiping and lifting motion (B) until the plugwire tip has displaced the contact spring (C) approximately .080". In this process of closing, as above, the contact spring travels along the plugwire tip approximately 3/16".



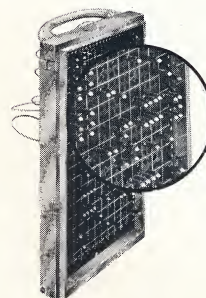
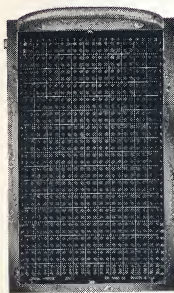
PLUGBOARDS

MAC Panel plugboards consist of one or more panels of molded general purpose black phenolic or blue diallyl phthalate set into extruded aluminum frames. The frames are accurately machined to assure interchangeability and accurate alignment between the plugwire tips and the receiver contact springs. Removable metal dust covers are available for all plugboards.

The plugboards accommodate manual or fixed self-contacting plugwires. A skirt around the plugboard extends below the projecting plugwire tips so that no damage will result when the plugboard is laid on a flat surface.

The molded panels are available either unmarked, silk-screened with MAC Panel's general purpose legend or silk-screened to order in one or more colors. The reverse side of the plugboard panels (and the panels of the receiver) can be silk-screened with the reverse image of the legend on the face of the plugboard. All silk screening is baked on by infrared heating.

The price of plugboards includes the cost of a silk-screened, one color MAC Panel general purpose legend. When a special legend is requested, an initial one-time charge for artwork and silk-screen construction is additional. Special legends should be submitted for quotations. Three copies of special legend drawings are required for silk-screen construction. Artwork remains the property of the customer and is available upon written request.



PLUGBOARD FRAMES

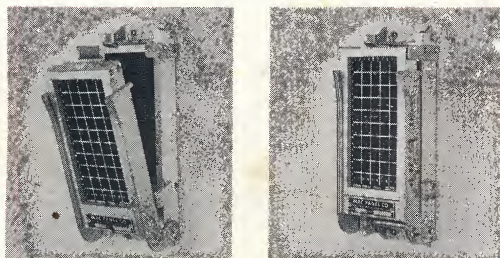
Model	Material
901	Aluminum Die Cast (Polished)
All other Panel Models	Extruded Aluminum (Polished)

PLUGBOARD INSERTS

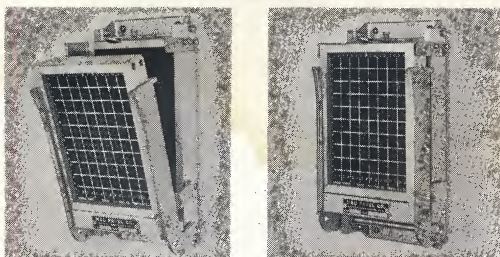
Material	Leakage Resistance Between Adjacent Holes	Hole Spacing (Center to Center)		
		Model	Horizontal	Vertical
Phenolic	$> 5 \times 10^{10}$	901, 909	.281"	.281"
Diallyl Phthalate (mineral filled, nylon fibre reinforced)	$> 1 \times 10^{13}$	All other models	.250"	.281"

RECEIVERS

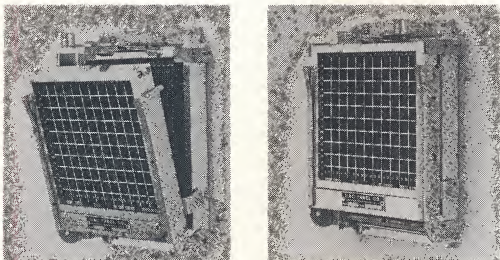
Number of Positions



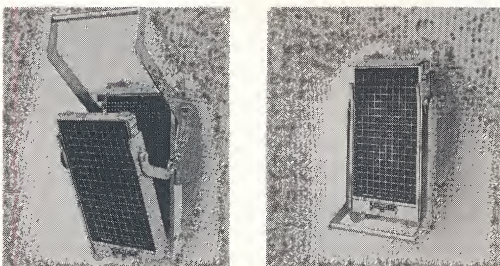
200 POSITIONS — MODEL 902



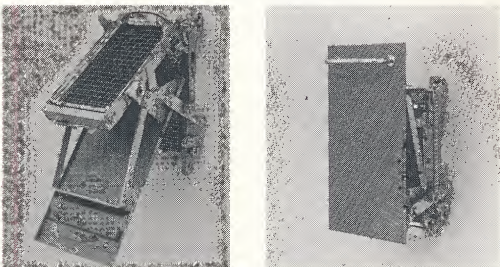
320 POSITIONS — MODEL 903



440 POSITIONS — MODEL 904



680 POSITIONS — MODEL 901



748 POSITIONS — MODEL 911

Position Arrangement		Panel Material	Contact Plating	Catalog Number	Dimensions and Weight	
Horizontal	Vertical					
10	20	Phenolic	Nickei	109021	Width: 4-3/32" Height: 10 3/8" Thickness: 3" Weight: 3 1/8 lbs.	
			Gold	109022		
		Diallyl Phthalate	Nickel	129021		
			Gold	129022		
16	20	Phenolic	Nickel	109031	Width: 5 1/8" Height: 10 3/8" Thickness: 3" Weight: 3 3/4 lbs.	
			Gold	109032		
		Diallyl Phthalate	Nickel	129031		
			Gold	129032		
22	20	Phenolic	Nickel	109041	Width: 7-3/16" Height: 10 3/8" Thickness: 3 3/4" Weight: 4 1/4 lbs.	
			Gold	109042		
		Diallyl Phthalate	Nickel	129041		
			Gold	129042		
20	34	Phenolic	Nickel	109011	Width: 8 5/8" Height: 14-1/16" Thickness: 5 7/8" Weight: 9 1/4 lbs.	
			Gold	109012		
		Diallyl Phthalate	Nickel	129011		
			Gold	129012		
22	34	Phenolic	Nickel	109111	Width: 10 3/8" Height: 16 3/4" Thickness: 6 3/4" Weight: 21 lbs.	
			Gold	109112		
		Diallyl Phthalate	Nickel	129111		
			Gold	129112		

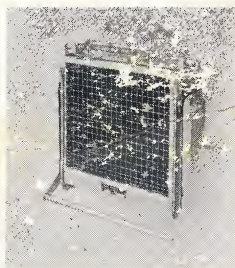
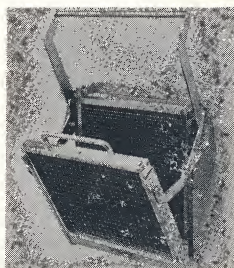
PLUGBOARDS

COVERS

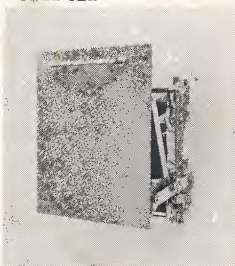
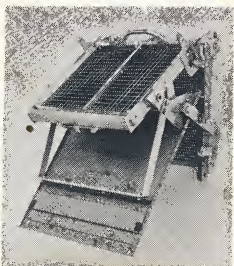
	Panel Material	Silk Screened Legend	Catalog Number	Dimensions and Weight	Depth	Catalog Number
	Phenolic	Blank	209020	Width: 3-9/16" Height: 6¾" Thickness: 1¼" Weight: 1 lb.	1"	219020
		General Purpose	209021			
		Special	209022			
	Diallyl Phthalate	Blank	229020		1¾"	239020
		General Purpose	229021			
		Special	229022			
	Phenolic	Blank	209030	Width: 5-1/16" Height: 6¾" Thickness: 1¼" Weight: 1¼ lbs.	1"	219030
		General Purpose	209031			
		Special	209032			
	Diallyl Phthalate	Blank	229030		1¾"	239030
		General Purpose	229031			
		Special	229032			
	Phenolic	Blank	209040	Width: 6⅝" Height: 6¾" Thickness: 1¼" Weight: 1½ lbs.	1"	219040
		General Purpose	209041			
		Special	209042			
	Diallyl Phthalate	Blank	229040		1¾"	239040
		General Purpose	229041			
		Special	229042			
	Phenolic	Blank	209010	Width: 6¼" Height: 10⅝" Thickness: 1-3/16" Weight: 2¼ lbs.	1"	219010
		General Purpose	209011			
		Special	209012			
	Diallyl Phthalate	Blank	229010		1¾"	239010
		General Purpose	229011			
		Special	229012			
	Phenolic	Blank	209110	Width: 6⅝" Height: 11¼" Thickness: 1¼" Weight: 2¼ lbs.	1"	219110
		General Purpose	209111			
		Special	209112			
	Diallyl Phthalate	Blank	229110		3½"	239110
		General Purpose	229111			
		Special	229112			

RECEIVERS

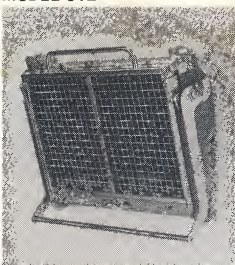
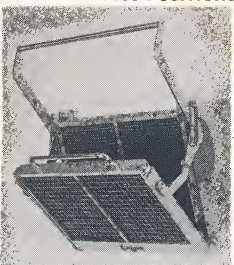
Number of Positions



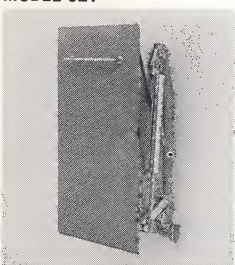
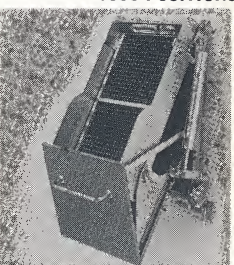
1280 POSITIONS — MODEL 922



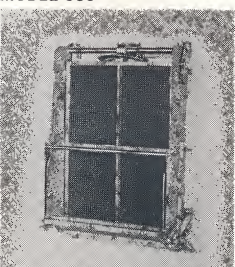
1496 POSITIONS — MODEL 912



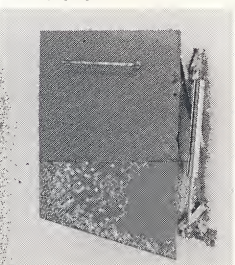
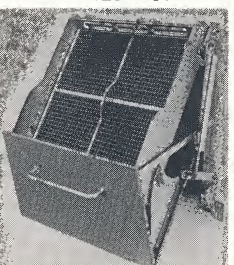
1600 POSITIONS — MODEL 921



2560 POSITIONS — MODEL 908



3264 POSITIONS — MODEL 909



5120 POSITIONS — MODEL 910

Position Arrangement		Panel Material	Contact Plating	Catalog Number	Dimensions and Weight
Horizontal	Vertical				
40	32	Phenolic	Nickel	109221	Width: 13 $\frac{3}{8}$ " Height: 13-5/8" Thickness: 6-5/32" Weight: 18 lbs.
			Gold	109222	
		Diallyl Phthalate	Nickel	129221	
			Gold	129222	
44	34	Phenolic	Nickel	109121	Width: 16 $\frac{3}{4}$ " Height: 16 $\frac{3}{4}$ " Thickness: 6 $\frac{3}{4}$ " Weight: 31 lbs.
			Gold	109122	
		Diallyl Phthalate	Nickel	129121	
			Gold	129122	
50	32	Phenolic	Nickel	109211	Width: 16-5/16" Height: 13 $\frac{5}{8}$ " Thickness: 6 $\frac{1}{4}$ " Weight: 21 $\frac{1}{4}$ lbs.
			Gold	109212	
		Diallyl Phthalate	Nickel	129211	
			Gold	129212	
40	64	Phenolic	Nickel	109081	Width: 16-3/32" Height: 26-15/16" Thickness: 6 $\frac{3}{4}$ " Weight: 60 lbs.
			Gold	109082	
		Diallyl Phthalate	Nickel	129081	
			Gold	129082	
48	68	Phenolic	Nickel	109091	Width: 17-13/16" Height: 26 $\frac{7}{8}$ " Thickness: 6-15/16" Weight: 52 lbs.
			Gold	109092	
		Diallyl Phthalate	Nickel	129091	
			Gold	129092	
80	64	Phenolic	Nickel	109101	Width: 26-15/16" Height: 26-15/16" Thickness: 6 $\frac{3}{4}$ " Weight: 96 $\frac{1}{2}$ lbs.
			Gold	109102	
		Diallyl Phthalate	Nickel	129101	
			Gold	129102	

31 PLUGBOARDS

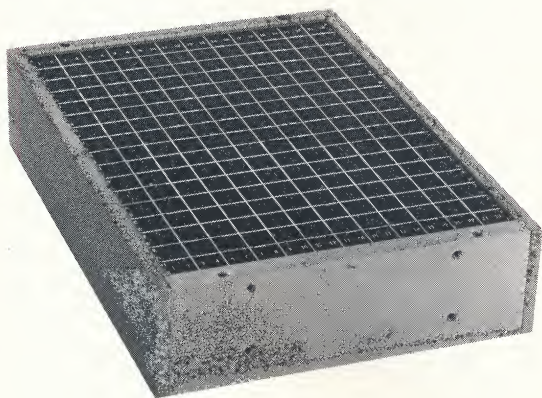
COVERS

Panel Material	Silk Screened Legend	Catalog Number	Dimensions and Weight	Depth	Catalog Number
Phenolic Diallyl Phthalate	Blank	209220	Width: 11-1/16" Height: 11 5/8" Thickness: 1 1/4" Weight: 3 3/8 lbs.	1"	219220
	General Purpose	209221			
	Special	209222			
	Blank	229220		2 3/4"	239220
	General Purpose	229221			
	Special	229222			
Phenolic Diallyl Phthalate	Blank	209120	Width: 11 1/2" Height: 11-3/16" Thickness: 1 1/4" Weight: 4 lbs.	1"	219120
	General Purpose	209121			
	Special	209122			
	Blank	229120		3"	239120
	General Purpose	229121			
	Special	229122			
Phenolic Diallyl Phthalate	Blank	209210	Width: 14" Height: 11-9/16" Thickness: 1 1/4" Weight: 4 lbs.	1"	219210
	General Purpose	209211			
	Special	209212			
	Blank	229210		2 3/4"	239210
	General Purpose	229211			
	Special	229212			
Phenolic Diallyl Phthalate	Blank	209080	Width: 11 1/4" Height: 20 3/4" Thickness: 1 1/4" Weight: 7 lbs.	1 1/2"	219080
	General Purpose	209081			
	Special	209082			
	Blank	229080		2 3/4"	239080
	General Purpose	229081			
	Special	229082			
Phenolic Diallyl Phthalate	Blank	209090	Width: 15 1/4" Height: 21 5/8" Thickness: 2 7/8" Weight: 10 1/4 lbs.	1 1/2"	219090
	General Purpose	209091			
	Special	209092			
	Blank	229090		2 3/4"	239090
	General Purpose	229091			
	Special	229092			
Phenolic Diallyl Phthalate	Blank	209100	Width: 21 7/8" Height: 20 3/4" Thickness: 1 1/4" Weight: 12 3/4 lbs.	1 1/2"	219100
	General Purpose	209101			
	Special	209102			
	Blank	229100		2 3/4"	239100
	General Purpose	229101			
	Special	229102			

FIXED PLUGBOARD PROGRAMMING SYSTEMS

When there is no need for a removable plugboard, such as when program changes are slight or infrequent, a fixed plugboard system is indicated.

The fixed plugboard programming system consists of a contact panel and a plugboard panel held in the proper relationship by a surrounding frame. Connection to the contacts and patching are accomplished in the same manner and with the same hardware as the removable plugboard systems. Manual Plugwires only may be used.



FRAMES

Material	Finish
Aluminum	MIL-C-5541

CONTACT SPRINGS

Material	Plating Thickness	Average Contact Resistance	Continuous Current Rating	Maximum Operating Voltage (Sea Level)
Beryllium Copper (Heat Treated)	Nickel .0001"	Nickel Contact Spring to Nickel Tip .009 Ω	5 Amperes at 68° F	1500v DC/1000v RMS AC
	Gold .00006" (over .0001" Nickel)	Gold Contact Spring to Gold Tip .004 Ω		

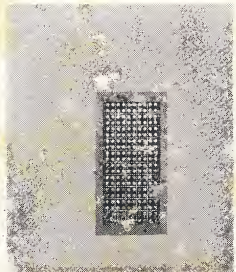
PANELS

Material	Leakage Resistance Between Adjacent Holes	Hole Spacing (Center to Center)		
		Model	Horizontal	Vertical
Phenolic	$> 5 \times 10^{10}$	809	.281"	.281"
Diallyl Phthalate (mineral filled, nylon fibre reinforced)	$> 1 \times 10^{13}$	All Other Models	.250"	.281"

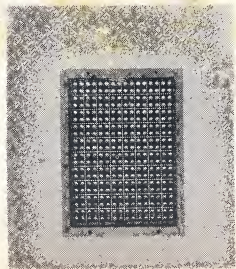
CAPACITANCE AND INDUCTANCE

		Phenolic	Diallyl
CAPACITANCE between adjacent contact springs and plugwire tip combination:	Horizontal	5.0 mmf.	5.98 mmf.
	Vertical	4.25 mmf.	5.10 mmf.
CAPACITANCE between one contact spring-plugwire tip combination and eight surrounding:		12.95 mmf.	15.5 mmf.
INDUCTANCE of contact spring—plugwire tip combination:		.05 μ h	

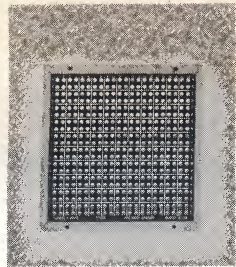
MODEL 802
200 POSITIONS



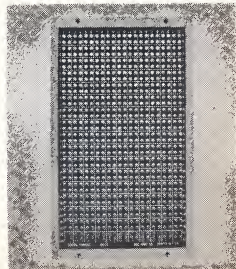
MODEL 803
320 POSITIONS



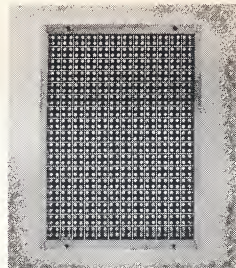
MODEL 804
440 POSITIONS



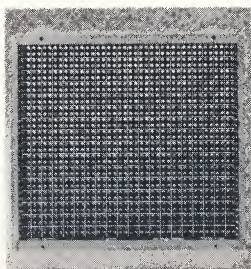
MODEL 811
748 POSITIONS



MODEL 809
816 POSITIONS



MODEL 822
1280 POSITIONS



Position Arrangement		Panel Material	Contact Plating	Catalog Number	Dimensions and Weight
Horizontal	Vertical				
	20	Phenolic	Nickel	108021	Width: 3 $\frac{7}{8}$ " Height: 6 $\frac{7}{8}$ " Thickness: 2"
			Gold	108022	
		Diallyl Phthalate	Nickel	128021	
			Gold	128022	
16	20	Phenolic	Nickel	108031	Width: 4 $\frac{7}{8}$ " Height: 6 $\frac{7}{8}$ " Thickness: 2"
			Gold	108032	
		Diallyl Phthalate	Nickel	128031	
			Gold	128032	
22	20	Phenolic	Nickel	108041	Width: 6-7/16" Height: 6 $\frac{7}{8}$ " Thickness: 2"
			Gold	108042	
		Diallyl Phthalate	Nickel	128041	
			Gold	128042	
22	34	Phenolic	Nickel	108111	Width: 6-7/16" Height: 11 $\frac{1}{8}$ " Thickness: 2"
			Gold	108112	
		Diallyl Phthalate	Nickel	128111	
			Gold	128112	
24	34	Phenolic	Nickel	108091	Width: 7-9/16" Height: 10 $\frac{1}{2}$ " Thickness: 2"
			Gold	108092	
		Diallyl Phthalate	Nickel	128091	
			Gold	128092	
40	32	Phenolic	Nickel	108221	Width: 10 $\frac{7}{8}$ " Height: 10 $\frac{1}{4}$ " Thickness: 2"
			Gold	108222	
		Diallyl Phthalate	Nickel	128221	
			Gold	128222	

Silk-Screening: Fixed Plugboard Systems are normally supplied with MAC Panel standard general purpose legend. Special legends should be submitted for individual quotation at which time a part number will be assigned to the special legend.

PLUGWIRES

Manual plugwires are equipped with a ball-d-tent device which prevents the plugwire from being dislodged when pushed from the rear side of the panel. However, it is easily removed by pulling on the plugwire from the front side.

Manual wire styles consist of single conductor, single conductor Y-type, coaxial, dual conductor, shielded twisted pair, 5 conductor, 4 conductor shielded, and 7 conductor shielded. The dual conductor plugwire has color coded wire to distinguish polarity. The coaxial plugwire, shielded twisted pair plugwire, 4 conductor shielded plugwire, 7 conductor shielded plugwire, and the 5 conductor plugwire, have polarized tip moldings.

Also available are jackplugs (for shunting vertical or horizontal adjacent holes), and common connector assemblies (for making Y-connected plugwires). All plugwires are color coded as to length for easy identification.

The fixed wire is locked into the hole of the panel by a spring-barb which is integral with the tip. Removal of fixed wires is easily and rapidly accomplished by the use of a wire tool available from MAC Panel. The fixed wire is not damaged by frequent removal and can be used indefinitely.

Fixed plugwires are available in a number of color-coded lengths, either in single or Y-type styles. Y-type plugwires are made with as many as six wires, all connected by a solderless color-coded connector. Special Y-type plugwires in any number of wire endings and lengths will be made by MAC Panel on special order.

Diode wires, in which a high quality diode is encapsulated in a rigid thermoplastic material, are available in both fixed and manual styles. The diode is rated at 125 ma. forward current and 250v peak inverse voltage.

MATERIAL AND SPECIFICATIONS

PLUGWIRE TIPS

Type	Base Material	Plating Thickness	Crimp Test
Nickel	Brass	.0001"	20 lbs. Pullout
Gold	Brass	.00003" Hard Gold over .0001" Nickel.	20 lbs. Pullout

PLUGWIRES

Type	Conductor	Voltage Rating	Insulation	Jacket	Tip Molding	Capacitance	Impedance
Manual Plugwires	No. 20 AWG (41 strands of No. 36 AWG)	300v RMS	Polyvinyl Chloride Plastic (PVC)	Lacquered Braided Cotton	PVC		
Fixed Plugwires	No. 20 AWG (7 strands of No. 28 AWG)	300v RMS	PVC				
Coaxial Plugwires	(7 strands of .0063")	1500v RMS	Teflon	PVC	PVC	30 mmf/ft.	50 Ω
Shielded Twisted Pair Plugwires	No. 20 AWG (19 strands of No. 32 AWG. Silver plated Copper)	600v RMS	Teflon	PVC	PVC	Conductor to Conductor: 33.3 mmf/ft. Conductor to Shield: 56.8 mmf/ft.	Conductor to Conductor: 44.3 Ω Conductor to Shield: 27.0 Ω
Five Conductor Plugwires	No. 24 AWG (7 strands of No. 32 AWG)	600v RMS	PVC	PVC	PVC		
Four Conductor Shielded Plugwires	No. 24 AWG (7 strands of No. 32 AWG)	1000v RMS	PVC	PVC	PVC		
Seven Conductor Shielded Plugwires	No. 20 AWG (7 strands of No. 28 AWG)	1000v RMS	PVC	PVC	PVC		

FIXED PLUGWIRES

range of color-coded lengths

FIXED SINGLE CONDUCTOR PLUGWIRES

Overall Length	Tip Plating	Catalog Number	Insulation Color
4"	Nickel Gold	310401	Gray
		310402	
7"	Nickel Gold	310701	Black
		310702	
10"	Nickel Gold	310901	Yellow
		310902	
13"	Nickel Gold	311201	Red
		311202	
15"	Nickel Gold	311501	Blue
		311502	
24"	Nickel Gold	312401	Green
		312402	
32"	Nickel Gold	313201	Orange
		313202	

FIXED SINGLE CONDUCTOR PLUGWIRES

3 Pin
Common



4 Pin
Common



5 Pin
Common



6 Pin
Common



FIXED Y-TYPE PLUGWIRES

Length	Tip Plating	Catalog Number				Insulation Color
		3 Pin Common	4 Pin Common	5 Pin Common	6 Pin Common	
9"	Nickel Gold	310931	310941 310942	310951 310952	310961 310962	Yellow
		310932				
12"	Nickel Gold	311231	311241 311242	311251 311252	311261 311262	Red
		311232				
15"	Nickel Gold	311531	311541 311542	311551 311552	311561 311562	Blue
		311532				
24"	Nickel Gold	312431	312441 312442	312451 312452	312461 312462	Green
		312432				
32"	Nickel Gold	313231	313241 313242	313251 313252	313261 313262	Orange
		313232				



WIRE TOOL for insertion and removal of fixed plugwires. Catalog Number 412000.

FIXED SINGLE DIODE WIRES

Length	Tip Plating	Part Number	Insulation Color
12"	Nickel Gold	1311201	Red
		1311202	
15"	Nickel Gold	1311501	Blue
		1311502	
24"	Nickel Gold	1312401	Green
		1312402	
32"	Nickel Gold	1313201	Orange
		1313202	

MANUAL PLUGWIRES

6			
3"			
12	91	3906	3906
15"			
24"	Nickel Gold		Green
32"	Nickel Gold	303201 303202	Orange
Jackplug	Nickel Gold	309001 309002	Gray
Connector	Nickel Gold	309101 309102	Blue



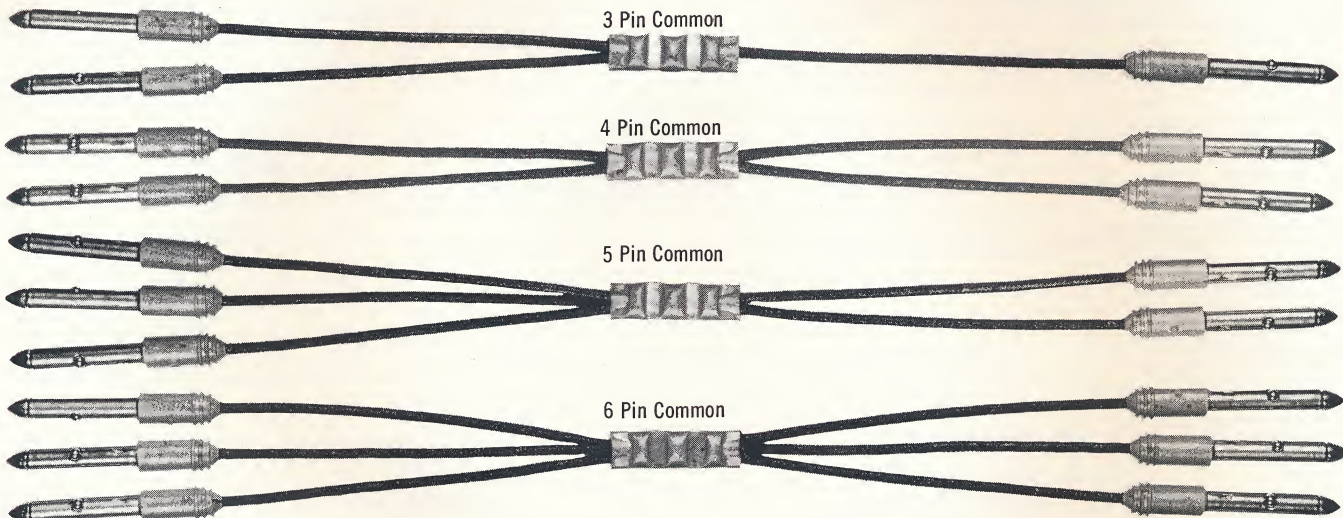
MANUAL SINGLE CONDUCTOR PLUGWIRE



CONNECTOR



JACKPLUG



MANUAL Y-TYPE PLUGWIRES

Overall Length	Tip Plating	Catalog Number				Insulation Color
		3 Pin Common	4 Pin Common	5 Pin Common	6 Pin Common	
9"	Nickel Gold	300931 300932	300941 300942	300951 300952	300961 300962	Yellow
12"	Nickel Gold	301231 301232	301241 301242	301251 301252	301261 301262	Red
15"	Nickel Gold	301531 301532	301541 301542	301551 301552	301561 301562	Blue
24"	Nickel Gold	302431 302432	302441 302442	302451 302452	302461 302462	Green
32"	Nickel Gold	303231 303232	303241 303242	303251 303252	303261 303262	Orange

MANUAL PLUGWIRES

MANUAL DUAL CONDUCTOR PLUGWIRES

Overall Length	Tip Plating	Catalog Number	Insulation Color
6"	Nickel Gold	330601 330602	Gray-Black
9"	Nickel Gold	330901 330902	Yellow-Black
12"	Nickel Gold	331201 331202	Red-Black
15"	Nickel Gold	331501 331502	Blue-Black
24"	Nickel Gold	332401 332402	Green-Black
32"	Nickel Gold	333201 333202	Orange-Black



MANUAL SINGLE CONDUCTOR COAXIAL PLUGWIRES

Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	320602	Black
9"	Gold	320902	Yellow
12"	Gold	321202	Red
15"	Gold	321502	Blue
24"	Gold	322402	Green
32"	Gold	323202	Orange



MANUAL TWO CONDUCTOR TWISTED PAIR SHIELDED PLUGWIRES

Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	340602	Black
9"	Gold	340902	Yellow
12"	Gold	341202	Red
15"	Gold	341502	Blue
24"	Gold	342402	Green
32"	Gold	343202	Orange



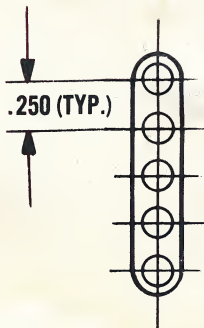
MANUAL SINGLE CONDUCTOR DIODE WIRE

FILTER PLUG This device consists of a high quality diode and plugwire receptacles encased in plastic. Receptacles will accommodate either manual or fixed wires. Diode is rated at 125 ma. forward current, 1 μ a. back current at 175v. Diodes of other specifications can be provided on special order. Catalog number: Brass Terminals 425000, Gold Plated Terminals 425032.



Length	Tip Plating	Part Number	Insulation Color
12"	Nickel Gold	1301201 1301202	Red
15"	Nickel Gold	1301501 1301502	Blue
24"	Nickel Gold	1302401 1302402	Green
32"	Nickel Gold	1303201 1303202	Orange

For use on .250 Centers

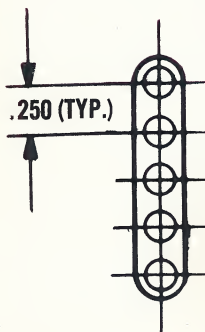


Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Nickel Gold	390602	Black
9"	Nickel Gold	390901 390902	Yellow
12"	Nickel Gold	391201 391202	Red
15"	Nickel Gold	391501 391502	Blue
24"	Nickel Gold	392401 392402	Green
32"	Nickel Gold	393201 393202	Orange

FOUR-CONDUCTOR SHIELDED PLUGWIRE

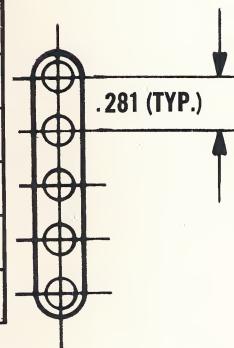
For use on .250 Centers

For use on .281 Centers



Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	350602	Black
9"	Gold	350902	Yellow
12"	Gold	351202	Red
15"	Gold	351502	Blue
24"	Gold	352402	Green
32"	Gold	353202	Orange

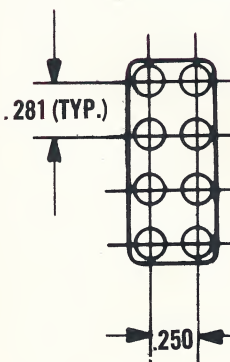
Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	350612	Black
9"	Gold	350912	Yellow
12"	Gold	351212	Red
15"	Gold	351512	Blue
24"	Gold	352412	Green
32"	Gold	353212	Orange



SEVEN-CONDUCTOR SHIELDED PLUGWIRE

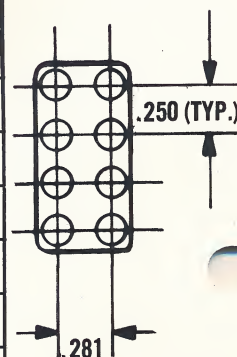
For vertical use

For horizontal use



Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	380602	Black
9"	Gold	380902	Yellow
12"	Gold	381202	Red
15"	Gold	381502	Blue
24"	Gold	382402	Green
32"	Gold	383202	Orange

Overall Length	Tip Plating	Catalog Number	Tip Insulation Color
6"	Gold	380612	Black
9"	Gold	380912	Yellow
12"	Gold	381212	Red
15"	Gold	381512	Blue
24"	Gold	382412	Green
32"	Gold	383212	Orange



GENERAL EQUIPMENT AND TOOLS

Makes single connection between internal equipment wiring and receptacle of contact spring. Made of brass, drilled for various wires which can be either soldered or crimped. Supplied unplated, nickel plated, or gold plated. Nickel plating is .0001" thick. Gold plating is hard gold, .00003" thick over .0001" thick nickel plating.

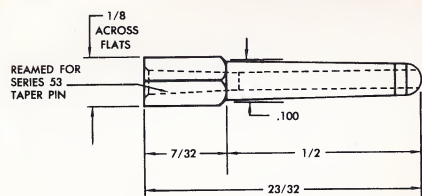
CATALOG NUMBERS

Plating	157-18	157-20	157-22
Unplated	423200	423000	423300
Nickel	423201	423101	423301
Gold	423232	423032	423332

TAPER PIN TERMINAL

SERIES 157-53

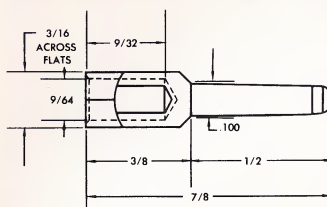
Used as an adapter between contact spring receptacle and series 53 taper pin. Plating specifications identical to taper pin terminal above. **Catalog Numbers:** Unplated, 423004; Nickel Plated, 423105; Gold Plated, 423036.



TAPER PIN TERMINAL

MULTIPLE-SERIES 157

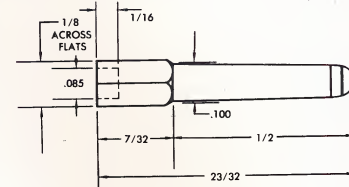
Used to terminate several wires of internal equipment wiring at one point. Side vent in taper pin permits easy soldering of wire endings. Plating specifications identical to taper pin terminal above. **Catalog Numbers:** Unplated, 425004; Nickel Plated, 425105; Gold Plated, 425036.



TAPER PLUG

SERIES 157

Used with shunts below to shunt contact springs on rear of receiver panel. Plating specifications identical to taper pin terminal above. **Catalog Numbers:** Unplated, 422004; Nickel Plated, 422105; Gold Plated, 422036.



STRAIGHT SHUNTS

Used with taper plugs and/or pin terminals to shunt adjacent positions of contact springs on rear of receiver panel. Horizontal contact spring spacing is .250" on all models except the 900 and 901, which have .281" spacing. Vertical contact spring spacing is .281" on all models. .250" shunt is distinguished from .281" shunt by the corner cut. Made of phosphor bronze, with plating same as taper pin terminal.

Catalog Numbers:	Unplated	Nickel	Gold
.250" Centers	408000	408101	408032
.281" Centers	408004	408105	408036

STRIP SHUNTS

Horizontal and vertical shunts as shown above are also available in strip form. Horizontal shunts are on .250" centers and cover 40 consecutive positions on the receiver. Vertical shunts are on .281" centers and cover 34 consecutive positions on the receiver. Shunts may be cut to length as required. **Catalog Numbers:** Horizontal — Nickel, 417401; Gold, 417402. Vertical — Nickel, 407341; Gold, 407342.

DIAGONAL SHUNTS

Used with taper plugs and/or pin terminals above to shunt adjacent diagonal contact springs on rear of receiver panel. Plating specifications identical to taper pin terminal above. Made of phosphor bronze. **Catalog Numbers:** Unplated, 409000; Nickel Plated, 409101; Gold Plated, 409032.

HAND CRIMPING TOOL

Used to crimp taper pin terminals series 157-18/-20/22 to internal equipment wiring. Tool is crimping cycle controlled to assure the quality of the four-indent crimp. **Catalog Numbers:** Crimping Tool Frame, 452000; Taper Pin Positioner, 452001; Gaging Pin, 452002.



TAPER PIN INSERTION TOOL

Used to insert all taper pin terminals. Tool provides for manual insertion of pins into contact springs. Tool is spring controlled to give a constant insertion energy and to limit compressive stresses in the board to a safe level. **Catalog Number:** 413001.



TAPER PIN EXTRACTION TOOL

For use in the removal of all taper pin terminals with the exception of multiple taper pin. **Catalog Number:** 415000.





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